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Application No.: 10/660,089

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Docket No.: JCLA11934

AMENDMENTSIn The Claims:

Please amend the claims as follows:

Claim 1 (currently amended) An image interpolating method, wherein low resolution pixels Y_{ij} of an image are zoomed to high resolution pixels $Y_{2i,2j}$, comprising:

receiving the low resolution pixels Y_{ij} ;

determining a homogenous area and an edge area of the image based on pixel differences of the pixels $Y_{2i,2j}$ in comparing with a threshold, wherein three variables of

$$\Delta Y_1 = |Y_{2i,2j} - Y_{2i+2p,2j+2q}|, \quad p, q \in \{(0,1), (1,0)\},$$

$$\Delta Y_2 = |Y_{2i+2,2j} - Y_{2i,2j+2}|, \text{ and}$$

$$\Delta Y_3 = |Y_{2i,2j} - Y_{2i+2,2j+2}|$$

are used to determine whether the homogenous area or the edge area by a condition set of:

if $\Delta Y_1 < \text{the threshold}$ then

the pixel $Y_{2i+p,2j+q}$ is in the homogenous area

else

the pixel $Y_{2i+p,2j+q}$ is in the edge area as one of edge pixels;

if $\Delta Y_2 < \text{the threshold}$ and $\Delta Y_3 < \text{the threshold}$ then

the pixel $Y_{2i+1,2j+1}$ is in the homogenous area

else if $\Delta Y_2 < \text{the threshold}$ then

the pixel $Y_{2i+1,2j+1}$ is in the homogenous area

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else if $\Delta Y_3 < \text{the threshold}$ thenthe pixel $Y_{2i+1,2j+1}$ is in the homogenous areaelsethe pixel $Y_{2i+1,2j+1}$ is in the edge area as one of edge pixels;

interpolating the low resolution pixels belonging to the homogenous area into the high resolution pixels by a first interpolating algorithm; and

interpolating the low resolution pixels belonging to the edge area into the high resolution pixels by a second interpolating algorithm.

Claim 2 (canceled)

Claim 3. (currently amended) The image interpolating method of claim 12, wherein the first interpolating algorithm includes obtaining the pixel $Y_{2i+p,2j+q}$ by calculating $(Y_{2i,2j} + Y_{2i+2p,2j+2q}) / 2$.

Claim 4 (currently amended) The image interpolating method of claim 12, wherein the first interpolating algorithm includes:

when $\Delta Y_2 < \text{the threshold}$ and $\Delta Y_3 < \text{the threshold}$,

the pixel $Y_{2i+1,2j+1}$ is obtained by calculating $Y_{2i+1,2j+1} = (Y_{2i+2,2j} + Y_{2i,2j+2}) / 2$ if the ΔY_2 less than ΔY_3 ; and

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the pixel $Y_{2i+1,2j+1}$ is obtained by calculating $Y_{2i+1,2j+1} = (Y_{2i,2j} + Y_{2i+2,2j+2}) / 2$ if the ΔY_3 is less than ΔY_2 .

Claim 5 (currently amended) The image interpolating method of claim 12, wherein the first interpolating algorithm includes:

when only $\Delta Y_2 < \text{the threshold for the } \Delta Y_2 \text{ and the } \Delta Y_3$, the pixel $Y_{2i+1,2j+1}$ is obtained by calculating $(Y_{2i+2,2j} + Y_{2i,2j+2}) / 2$.

Claim 6 (currently amended) The image interpolating method of claim 12, wherein the first interpolating algorithm includes:

when only $\Delta Y_3 < \text{the threshold for the } \Delta Y_2 \text{ and the } \Delta Y_3$, the pixel $Y_{2i+1,2j+1}$ is obtained by calculating $(Y_{2i,2j} + Y_{2i+2,2j+2}) / 2$.

Claim 7 (currently amended) ~~The image interpolating method of claim 1,~~ An image interpolating method, wherein low resolution pixels $Y_{i,j}$ of an image are zoomed to high resolution pixels $Y_{2i,2j}$, the method comprising:

receiving the low resolution pixels $Y_{i,j}$;

determining a homogenous area and an edge area of the image based on pixel differences of the pixels $Y_{2i,2j}$ in comparing with a threshold;

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interpolating the low resolution pixels belonging to the homogenous area into the high resolution pixels by a first interpolating algorithm; and

interpolating the low resolution pixels belonging to the edge area into the high resolution pixels by a second interpolating algorithm, wherein the first interpolating algorithm includes:

when the pixels $Y_{2i, 2j}$ in the homogenous area, the pixels $Y_{2i, 2j}$ are interpolated by a linear interpolation algorithm.

Claim 8 (currently amended) The image interpolating method of claim 12, wherein the second interpolating algorithm includes interpolating the pixels $Y_{2i, 2j}$ along a direction having a minimum difference in the neighboring pixels.

Claim 9 (original) The image interpolating method of claim 8, wherein the neighboring pixels of one of the pixels $Y_{2i, 2j}$ does not include a determined edge pixel.

Claim 10 (original) The image interpolating method of claim 8, wherein when the minimum difference diff_{\min} is determined by taking a minimum of four differences of

$$\text{diff}_1 = |Y_{2i-1, 2j} - Y_{2i+1, 2j}|,$$

$$\text{diff}_2 = |Y_{2i-1, 2j-1} - Y_{2i+1, 2j+1}|,$$

$$\text{diff}_3 = |Y_{2i, 2j-1} - Y_{2i, 2j+1}|, \text{ and}$$

$$\text{diff}_4 = |Y_{2i+1, 2j-1} - Y_{2i-1, 2j+1}|,$$

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wherein the differences including one of the edge pixels is skipped.

Claim 11 (original) The image interpolating method of claim 8, wherein the pixel Y_{ij} is obtained by calculating $(Y_{2i-1,2j} + Y_{2i+1,2j}) / 2$ at a direction with the minimum pixel difference.

Claim 12 (original) An image interpolating algorithm for an image, wherein low resolution pixels $Y_{i,j}$ of the image are zoomed to high resolution pixels $Y_{2i,2j}$, wherein three variables of $\Delta Y_1 = |Y_{2i,2j} - Y_{2i+2p,2j+2q}|$, $\Delta Y_2 = |Y_{2i+2,2j} - Y_{2i,2j+2}|$, and $\Delta Y_3 = |Y_{2i,2j} - Y_{2i+2,2j+2}|$, $p, q \in \{(0,1), (1,0)\}$ are used, the image interpolating algorithm comprising:

determining at least one of edge pixel and interpolating the pixels $Y_{2i,2j}$ if the pixel to be interpolated is not the edge pixel by a first algorithm as follows:

if $\Delta Y_1 < \text{a threshold}$ then

$$Y_{2i+p,2j+q} = (Y_{2i,2j} + Y_{2i+2p,2j+2q}) / 2$$

else

$Y_{2i+p,2j+q}$ are the edge pixel

if $\Delta Y_2 < \text{the threshold}$ and $\Delta Y_3 < \text{the threshold}$ then

$$\Delta Y_{\min} = \min\{\Delta Y_2, \Delta Y_3\}$$

if $\Delta Y_{\min} = \Delta Y_2$

$$Y_{2i+1,2j+1} = (Y_{2i+2,2j} + Y_{2i,2j+2}) / 2$$

else

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$$Y_{2i+1,2j+1} = (Y_{2i,2j} + Y_{2i+2,2j+2}) / 2$$

else if $\Delta Y_2 < \text{the threshold}$ then

$$Y_{2i+1,2j+1} = (Y_{2i+2,2j} + Y_{2i,2j+2}) / 2$$

else if $\Delta Y_3 < \text{the threshold}$ then

$$Y_{2i+1,2j+1} = (Y_{2i,2j} + Y_{2i+2,2j+2}) / 2$$

else

$Y_{2i+1,2j+1}$ is one of the edge pixel.

Claim 13 (original) The image interpolating algorithm of claim 1, further comprising interpolating the edge pixels according to a second algorithm as follows:

calculating a plurality of pixel differences of

$$\text{diff}_1 = |Y_{2i-1,2j} - Y_{2i+1,2j}|,$$

$$\text{diff}_2 = |Y_{2i-1,2j-1} - Y_{2i+1,2j+1}|,$$

$$\text{diff}_3 = |Y_{2i,2j-1} - Y_{2i,2j+1}|, \text{ and}$$

$$\text{diff}_4 = |Y_{2i+1,2j-1} - Y_{2i-1,2j+1}|,$$

wherein the differences including one of the edge pixels is skipped;

finding a minimum of the pixel differences; and

interpolating the pixel $Y_{2i,2j} = (Y_{2i-1,2j} + Y_{2i+1,2j}) / 2$ at a direction with the minimum pixel difference.

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